REMARKS

In the Office Action dated November 16, 2005, a typographical error was noted in claim 13, which has been corrected.

Claims 12-17 were rejected under 35 U.S.C. §102(b) as being anticipated by Yui et al. Claims 18-22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Yui et al in view of Yoshino et al.

These rejections are respectfully traversed for the following reasons.

The subject matter disclosed and claimed in the present application concerns a magnetic resonance apparatus that has at least one component, such as a gradient coil, that, in addition to its intended operation for generating a gradient field, unavoidably also serves as an eddy current generator. The magnetic resonance apparatus disclosed and claimed in the present application also includes at least one electrically conductive structure in which eddy currents caused by the eddy current generator can occur. Since the electrically conductive structure was claimed in claim 12 as a different claim element from the eddy current generator, this was intended to mean that the electrically conductive structure in which eddy currents caused by the eddy current generator can occur is a component other than the eddy current generator itself. This has been made explicitly clear by amending claim 12.

Additionally, claim 12 requires a force generator *attached* to the at least one electrically conductive structure, this force generator generating forces that are mechanically applied to the aforementioned electrically conductive structure so as to counteract the Lorentz forces, thereby precluding movement and deformation of the electrically conductive structure that would otherwise occur due to the Lorentz forces. Since the at least one electrically conductive structure in claim 12 is

differentiated from the eddy current generator, this means that the aforementioned force generator, in accordance with claim 12, is not attached to the eddy current generator itself, but instead is attached to the electrically conductive structure, which is a structure other than the eddy current generator. Moreover, the basic underlying concept of the apparatus of claim 12 is not to try to prevent the *occurrence* of Lorentz forces, but instead is to mechanically apply a force to a component that would be moved or deformed by such Lorentz forces, so that such movement and deformation does not occur.

The aforementioned structure of the apparatus of claim 12, and the underlying operating concept thereof, are fundamentally different from the structure and operating concept of the apparatus disclosed in the Yui et al reference.

The Yui et al reference begins by noting, at column 1, lines 56-65, the conventional use of an active shield gradient coil (ASGC) that has the purpose of effectively cancelling a so-called "leaking magnetic field" from the primary coil. This is accomplished by means of an appropriate current distribution at the cylindrical surface that encloses the primary coil.

As further explained at column 2, lines 9-27 of the Yui et al reference, the ASGC conventionally has a long current path due to the presence of current returns, thereby making it impossible to obtain a high speed gradient field switching characteristic or a large gradient magnetic field strength. Yui et al then describe the conventional solution to this problem, which involves cutting one or more of the current returns in the ASG.

Yui et al then further note, at column 2, lines 28-37, that this conventional approach has the disadvantage of degrading the gradient magnetic field linearity as well as the leaking magnetic field shielding power.

All of the embodiments disclosed in the Yui et al reference, therefore, are directed to ways to make use of the conventional technique of minimizing eddy current generation by minimizing, or making zero, the aforementioned "leaking magnetic field," while avoiding the aforementioned disadvantages of degrading the linearity of the gradient magnetic field and the shielding field.

All of the measures that are put to use in the Yui et al reference for achieving this goal are explained in a first embodiment, beginning at column 7, line 14 through column 11, line 25. In the next paragraph, beginning at column 11, line 26, it is stated in Yui et al that the result of all these measures is to make the leaking magnetic field produced by the current distributions of the primary coil and the connecting phase to be nearly zero at an exterior region of the coil, while generating the gradient magnetic field with a good linearity in the desired imaging field of view.

A second embodiment is then described in the Yui et al reference at column 12, lines 23-65, followed by a description of a third embodiment beginning at column 13, line 1 through column 14, line 62. The description of this third embodiment ends with the same statement of the result that was noted above in connection with the first embodiment, namely the leaking magnetic field is made to be nearly zero at the exterior region of the field coil, while maintaining good linearity of the gradient magnetic field (column 14, lines 53-62). This paragraph in the Yui et al reference is immediately followed by the paragraph noted by the Examiner at column 14, lines 63-66, which states that the directions of the currents are opposite in the primary coil

and the shield coil, so that the Lorentz forces exerted on the current turns cancel each other, thereby reducing the torque exerted on the gradient coil as a whole. This passage clearly has nothing whatsoever to do with cancelling or suppressing Lorentz forces due to eddy currents, but is instead simply a statement of the general technique that is employed in any apparatus having conductors positioned close to each other that each carry high currents, of making the currents flow in opposite directions so as to cancel the Lorentz forces produced by *those conductors.* The Lorentz forces that are cancelled arise due to the currents flowing in *those conductors,* and therefore this technique has nothing whatsoever to do with suppressing or cancelling Lorentz forces that occur due to eddy currents.

Therefore, the Yui et al reference operates on a completely different underlying concept from that disclosed and claimed in the present application. In the subject matter disclosed and claimed in the present application, no effort is made to prevent the occurrence of eddy currents and the Lorentz forces arising therefrom, but instead a force is applied to an electrically conductive component, separate from the source that generates the eddy currents, so as to preclude movement and deformation of that separate component that would otherwise occur due to the Lorentz forces. By contrast, the Yui et al reference attempts to prevent the occurrence of Lorentz forces in the first place, by the aforementioned goal of making the "leaking magnetic field" as close to zero as possible. Because of this completely different operating goal, there is no need, and therefore no teaching, in the Yui et al reference to apply a force to any component that would be expected to be moved or deformed by eddy currents. It is assumed in the Yui et al reference that if the apparatus operates as intended so as to make the "leaking magnetic field" as close

to zero as possible, virtually no eddy currents, and therefore virtually no Lorentz forces, will occur at all, and therefore there is no need, and thus no teaching, in the Yui et al reference to apply any sort of force to any component for the purpose of counteracting such (non-existent) Lorentz forces.

The Yui et al reference, therefore, does not disclose all of the elements of claim 12 as arranged and operating in that claim, and therefore does not anticipate claim 12, nor any of claims 13-17 depending therefrom.

As to claims 18-22, even if the Examiner's statements regarding the secondary Yoshino et al reference are correct, modifying the Yui et al reference in accordance with the teachings of Yoshino et al would not result in an apparatus as set forth in any of claims 18-22, which embody the subject matter of independent claim 12 therein. Moreover, in view of the aforementioned completely different underlying operating concept in the Yui et al reference, a person of ordinary skill in the field of designing magnetic resonance imaging apparatuses would have no basis whatsoever to attempt to modify the Yui et al reference, with or without the teachings of Yoshino et al, to arrive at the subject matter of claims 18-22.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

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